Complete Summary

GUIDELINE TITLE

Physician's guide to prevention and treatment of osteoporosis.

BIBLIOGRAPHIC SOURCE(S)

National Osteoporosis Foundation. Physician's guide to prevention and treatment of osteoporosis. Washington (DC): National Osteoporosis Foundation; 2003 Apr. 37 p. [14 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Osteoporosis
- Osteoporosis-related fractures

GUIDELINE CATEGORY

Diagnosis
Management
Prevention
Risk Assessment
Treatment

CLINICAL SPECIALTY

Endocrinology
Family Practice
Geriatrics
Internal Medicine

Obstetrics and Gynecology
Orthopedic Surgery
Physical Medicine and Rehabilitation
Radiology
Rheumatology

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To offer concise recommendations regarding prevention, risk assessment, diagnosis, management, and treatment of osteoporosis

TARGET POPULATION

- Adults of all ages (universal prevention recommendations)
- Postmenopausal white women (diagnosis and treatment recommendations)

Note: The guide primarily addresses postmenopausal white women because it is chiefly based on available evidence from randomized controlled clinical trials. It does not address men, premenopausal women, or women of other races, because there are insufficient data available to formulate comparable recommendations for these populations.

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

Bone mineral density testing using single photon absorptiometry (SPA) and single X-ray absorptiometry (SXA), dual-photon absorptiometry (DPA), dual X-ray absorptiometry (DXA), quantitative computed tomography (QCT), radiographic absorptiometry (RA), or ultrasound densitometry

Risk Assessment/Prognosis

1. Personal history of osteoporosis-related fracture
2. Bone density testing (dual x-ray absorptiometry [DXA], peripheral dual x-ray absorptiometry [pDXA], and single-energy x-ray absorptiometry [SXA]; quantitative computed tomography [QCT]; ultrasound densitometry) and testing of biochemical markers of bone turnover
3. Other risk factors

Management/Treatment and/or Prevention

1. Hormone replacement therapy (HRT)
2. Calcium
3. Vitamin D
4. Pharmacologic therapy: (calcitonin and other vitamin D analogs; bisphosphonates (e.g., alendronate, risedronate); estrogens and/or hormone

therapy; parathyroid hormone [PTH 1-34]; Selective estrogen receptor modulators [SERM] [e.g., raloxifene])
5. Fluoride
6. Exercise (weight bearing and muscle strengthening)
7. Avoidance of smoking tobacco and excessive alcohol intake
8. Measures to prevent falls
9. Patient education (risk of osteoporosis and related fractures)
10. Monitoring response to treatment

Note: Guideline developers discussed but did not recommend drugs not approved by the U.S. Food and Drug Administration (FDA) for prevention or treatment of osteoporosis (i.e., calcitriol, other bisphosphonates [etidronate, ibandronate, pamidronate, tiludronate, zoledronic acid], sodium fluoride, tibolone)

MAJOR OUTCOMES CONSIDERED

- Fractures and their complications
- Side effects and costs associated with treatment

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

1999 Version of Guideline:

To identify studies of various treatments, MEDLINE, Index Medicus, and Abstracts-on-Disk were searched for studies pertaining to each of the treatments. In addition, leads provided to the Development Committee in published articles and notices of work in progress were also pursued.

To be included in the evaluation of benefits of a treatment, studies had to meet these criteria:

- A randomized controlled design, or a good cohort design when there were no randomized controlled trials
- Comparison with a control group that received either no treatment, a placebo, or calcium. (Studies in which calcium was given to both the control and treated groups were accepted for the purpose of estimating benefits of a treatment when added to calcium.)
- Fracture as an outcome
- Clearly reported results, permitting calculation of the sizes of the groups on which results were based, and either the numbers of fractures or the numbers of patient who had fractures

In cases where little or no clinical trial data were available about the effectiveness of treatment (such as the effect of hormone replacement therapy [HRT] on

fracture risk), observational studies and prospective cohort studies were used in which drug use was assessed and then patients were followed for subsequent fractures.

2003 Version of Guideline:

Medline and Cochrane were used to search for relevant research in the updated guideline. Key references identified during the update process are listed at the end of the guideline document.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Decision Analysis
Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Evaluation of evidence. When possible, statistical significance was calculated on the basis of 'intent to treat'; that is, patients assigned to the treatment group were compared with those assigned to the control group, regardless of the degree of subsequent compliance with therapy. Otherwise, statistical significance was calculated from patients who had received active treatment, and such instances are noted in the text or the evidence tables.

Displaying results. The results of the most important studies are illustrated as probability distributions in the companion document (Lindsay R, Meunier PJ. Osteoporosis: Review of the evidence for prevention, diagnosis and treatment and cost-effectiveness analysis. Osteoporosis Int 1998;8(Suppl 4):S1-S88). Probability distributions convey all the information in the study about its design, size, and results. They show both the magnitude of the effect of a treatment and the range of uncertainty about that effect. Probability distributions are similar to confidence intervals, except that they make clear that the possible effect of the treatment is not uniformly distributed between the confidence limits. Probability distributions also provide a powerful visual tool for comparing studies and assessing evidence from multiple studies.

For this analysis, the results of specific trials have been displayed without any attempt to adjust for biases or segregate by fracture type. It is important to understand that trials might have reported the effects of treatment on different fracture types. Detailed descriptions of all of the trials are given in the treatment sections and their accompanying tables.

Combining results from several trials. No attempt at meta-analysis or pooling of results was made. Instead, where a 'dominant' trial (by size, design, treatment regimen, and representativeness of the population) could be identified, it was used as the basis for calculating representative balance sheets and recommendations that would apply to similar populations receiving similar treatment regimens. In cases with important trends that were not statistically significant, 'what if' analyses were performed to help understand the potential consequences or to help predict the possible results of larger trials or longer follow-up.

The balance sheets list the most important outcomes or events, include the probabilities of events with and without treatment, and highlight the actual difference in probabilities of the events caused by treatment. Net cost is also calculated.

'What if' calculations, one of two types of sensitivity analyses performed, specifically explored three issues:

- The possibility that short-term treatment has a longer-term effect on fractures by maintaining or increasing bone mineral density (BMD) [a 'residual effect']
- The possibility that the short-term beneficial effects of treatments seen in trials will continue with long-term treatment
- The possibility that charges for bone density measurements or that the costs of drugs will be less than they are today

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

This guide was developed by an expert committee from the National Osteoporosis Foundation (NOF) in collaboration with a multispecialty council of medical experts in the field of bone health convened by NOF.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

The guideline developers performed cost-effectiveness analyses described in detail in the companion document (Lindsay R, Meunier PJ. Osteoporosis: Review of the

evidence for prevention, diagnosis and treatment and cost-effectiveness analysis. Osteoporosis Int 1998;8(Suppl 4):S1-S88).

The analysis involved (1) estimating the probabilities that women will have fractures of various types, as a function of their age, risk factors, and bone mineral density (BMD); (2) estimating the probabilities of various consequences of fractures, along with their costs; (3) making assumptions about the effects of fractures and their consequences on a woman's quality of life; and (4) making judgments about the tradeoff between benefits, risks and costs.

The estimates of costs and effectiveness can be used two ways:

Individual decision making. For this purpose, information on both the costs and the effectiveness of various treatments are presented to women and their physicians so they can weigh the factors themselves. This information is presented in the balance sheets. Individual decisions will depend on each woman's personal preferences.

General recommendations. Costs and effectiveness are used to provide guidance for women and physicians who do not want to weigh the costs and effectiveness of different treatments on their own. The approach uses well-accepted principles of cost-effectiveness analysis. As described in the companion document, financial values can be assigned to the occurrences of various types of fractures and their consequences. The effectiveness of different treatments in decreasing the probabilities of fractures and their consequences can be used to calculate the expected financial value of the benefits of each treatment. The cost of treatment can be used to determine for each patient when the expected benefits of a treatment outweigh its costs.

The costs of treatment were obtained by using the lower of the direct or average wholesale prices contained in the current edition of the Red Book, confirmed in some cases by an informal survey of pharmacies in the Los Angeles, California, area. Base case assumptions about the effectiveness and costs of treatments were made. The importance of variations in and uncertainty about costs are explored in sensitivity analyses (where the effects of 10% increase in the probabilities of events, the costs of events, and the effects of events on the quality of life were calculated).

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Synopsis of Major Recommendations to the Physician

- Counsel all women on the risk of osteoporosis and related fractures.
- Advise all patients to consume adequate amounts of calcium (at least 1200 mg per day, including supplements if necessary) and vitamin D (400 to 800 IU per day for individuals for risk of deficiency).
- Recommend regular weight-bearing and muscle-strengthening exercise to reduce the risk of fall and fractures.
- Advise patients to avoid tobacco smoking and excessive alcohol intake.
- Recommend bone mineral density (BMD) testing to all women aged 65 and older.
- Recommend BMD testing to younger postmenopausal women who have one or more risk factors (other than being white, postmenopausal, and female).
- Recommend BMD testing to postmenopausal women who have suffered a fragility fracture to confirm the diagnosis and determine disease severity.
- Initiate therapy to reduce fracture risk in postmenopausal women with BMD T-scores by central dual x-ray absorptiometry (DXA) below -2 in the absence of risk factors and in women with T-scores below -1.5 if one or more risk factors are present.
- Consider postmenopausal women with vertebral or hip fractures candidates for osteoporosis treatment.
- Current pharmacologic options for osteoporosis prevention and/or treatment are bisphosphonates (alendronate and risedronate), calcitonin, estrogens and/or hormone therapy, parathyroid hormone (PTH 1-34), and raloxifene.

Universal Recommendations for all Individuals

- Advise all patients to consume adequate amounts of calcium (at least 1200 mg/day) and vitamin D (400-800 IU/day).
- Recommend regular weight-bearing and muscle-strengthening exercise and balance-training exercises to reduce the risk of falls and fractures.
- Advise all patients to avoid tobacco smoking and alcohol intake in excess of two drinks per day.

Additional Recommendations for Postmenopausal Women

- Counsel all women on the risk of osteoporosis and related fractures. Osteoporosis is a 'silent' risk factor for facture just as hypertension is for stroke.
- Recommend BMD testing to all women aged 65 and older.
- Recommend BMD testing to younger postmenopausal women who have one or more risk factors (other then being white, postmenopausal, and female).
- Recommend BMD testing to postmenopausal women who have suffered a facture as an adult to confirm diagnosis and determine disease severity.
- Initiate therapy to reduce fracture risk in postmenopausal women with BMD T-scores by dual x-ray absorptiometry (DXA) below -2 in the absence of risk factors.
- Initiate therapy to reduce fracture risk in postmenopausal women with BMD T-scores by DXA below -1.5 if one or more risk factors are present.
- Consider postmenopausal women with vertebral or hip factures candidates for osteoporosis treatment.

Major Risk Factors for Osteoporosis and Related Fracture in Caucasian Postmenopausal Women:

- Personal history of fracture as an adult
- History of fragility facture in a first-degree relative
- Low body weight (<about 127 lbs)
- Current smoking
- Use of oral corticosteroid therapy for more than 3 months

Additional Risk Factors:

- Impaired vision
- Estrogen deficiency at an early age (<45 yrs)
- Dementia
- Poor health/frailty
- Recent falls
- Low calcium intake (lifelong)
- Low physical activity
- Alcohol in amounts >2 drinks per day

Defining Osteoporosis by World Health Organization (WHO) BMD Criteria

The World Health Organization (WHO) has established the following definitions based on bone mass measurement at the spine, hip, or wrist in white postmenopausal women:

Normal: Bone mineral density (BMD) is within 1 standard deviation (SD) of a "young normal" adult (T-score at -1.0 and above).

Low bone mass (osteopenia): BMD is between 1 and 2.5 SD below that of a "young normal" adult (T-score between -1 and -2.5).

Osteoporosis: BMD is 2.5 SD or more below that of a "young normal" adult (T-score at or below -2.5). Women in this group who have already experienced one or more fractures are deemed to have severe or "established" osteoporosis.

Although these definitions are necessary to establish the prevalence of osteoporosis, they should not be used as the sole determinant of treatment decisions.

Who Should Be Tested?

The decision to test for BMD should be based on an individual's risk profile, and testing is never indicated unless the results could influence a treatment decision.

BMD testing should be performed on:

- All women aged 65 and older regardless of risk factors
- Postmenopausal women under age 65 with one or more risk factors in addition to being white, postmenopausal, and female
- Postmenopausal women who present with factures

Who Should Be Treated?

- In the absence of risk factors, initiate therapy to reduce fracture in women with BMD T-scores below -2.0 by DXA of the hip.
- With one or more risk factors, initiate therapy in women with BMD T-scores below -1.5 by DXA of the hip.
- Initiate therapy in women with a prior vertebral or hip fracture.

Pharmacologic Options

The following medications are approved by the Food and Drug Administration (FDA) for the prevention and/or treatment of osteoporosis. They are presented in alphabetical order. For detailed information, please refer to the complete product information on each medication.

Bisphosphonates

- Alendronate sodium (brand name Fosamax®) is approved for prevention (5-mg daily dose or 35-mg weekly dose) and treatment (10-mg daily dose and 70-mg weekly dose) of postmenopausal osteoporosis. Alendronate reduces the incidence of spine, hip, and nonspine fractures by 50%.
- Risedronate sodium (brand name Actonel®) is approved for prevention and treatment (5-mg daily dose and 35-mg weekly dose) of postmenopausal osteoporosis. Risedronate reduces the incidence of spine fractures by 40% and hip and nonspine fractures by 30%.
- Possible side effects include upper gastrointestinal disorders such as dysphagia, esophagitis, and esophageal or gastric ulcer. To reduce the risk of side effects, take these medications on an empty stomach with 8 oz. of tap water. Remain sitting or standing for at least 30 minutes and refrain from eating or drinking during this time.

Calcitonin (brand name Miacalcin®) is approved for treatment of osteoporosis in women who are at least 5 years postmenopausal. It is delivered as a single daily intranasal spray or injection. Calcitonin reduces the risk of spine fractures by 21%. Calcitonin is well tolerated but may cause rhinitis or, rarely, epistaxis.

Estrogen/hormone therapy (ET/HT available in a variety of brands) is approved for the prevention of postmenopausal osteoporosis. Women who have not had a hysterectomy require HT, which contains progestin to protect the uterine lining. While ET/HT reduces the risk of spine and hip fractures by 34%, its use resulted in increased risk for breast cancer, heart attack, stoke, and venous thromboembolism. On the basis of results from the Women's Health Initiative Study, the FDA has made the following recommendations:

- ET/HT should be used in the lowest doses possible for the shortest period of time to relieve menopausal symptoms.
- When considering ET/HT for prevention of osteoporosis, consider all available medications prior to making a decision.

Parathyroid hormone (PTH teriparatide) (brand name Fortéo®) is approved for the treatment of osteoporosis in postmenopausal women at risk for osteoporotic fractures. PTH is an anabolic peptide that increases bone density. It reduces the risk of spine fractures by 65% and nonspine fractures by 54% after an average of 18 months of therapy. PTH is administered as a daily subcutaneous

injection. Side effects include leg cramps and dizziness. Long-term safety is unknown, so use is limited to 2 years.

Raloxifene (brand name Evista®) is a selective estrogen receptor modulator that is approved for the prevention and treatment of postmenopausal osteoporosis. Raloxifene reduces the risk of spine factures by 40%. Possible side effects include hot flashes and deep vein thromboses. Raloxifene appears to reduce the risk of estrogen-dependent breast cancer.

NOF recommends that osteoporosis be treated with therapies specifically approved by the FDA for this purpose.

CLINICAL ALGORITHM(S)

An algorithm is provided for the evaluation and management of osteoporotic fracture risk.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based primarily on the available evidence from randomized controlled trials.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Overall Benefits

- Effective osteoporosis prevention and treatment strategies have the potential to increase bone mineral density (BMD) and reduce fractures and their complications.

Drug Therapies

- Estrogen/Hormone replacement therapy (HRT). The Women's Health Initiative (WHI) found that 5 years of hormone therapy reduced the risk of clinical vertebral fractures and hip fractures by 34%.
- Alendronate. Controlled clinical trials indicate that over a 3- to 4- year period alendronate increases bone mass and reduces the incidence of vertebral, hip, and all non-vertebral fractures by 50%.
- Risedronate. Controlled clinical trials indicate that risedronate increases bone mass and reduces the risk of vertebral fractures by 40% and all non-vertebral fractures by 30% over a 3-year period.
- Calcitonin. Controlled clinical trials indicate that calcitonin decreases the vertebral fracture rate by 54%. In the single large trial, however, it lowered vertebral fracture risk by 21%. It did not alter the non-vertebral fracture rate in any of the studies.

- Parathyroid hormone: Parathyroid hormone was recently shown to decrease the risk of vertebral fractures by 65% and non-vertebral fractures by 54% after an average of 18 months of therapy.
- Raloxifene. This drug is in a class of compounds called selective estrogen receptor modulators (SERMs), which have been developed to provide the beneficial effects of estrogens without their potential disadvantages. Raloxifene increases vertebral bone mass modestly and reduces the risk of vertebral fracture by 40%. Currently, there is no evidence that it significantly reduces risk of non-vertebral fractures.
- Exercise. Weight-bearing and muscle-strengthening exercise can improve agility, strength, and balance, which may reduce the risk of falls. In addition, exercise may increase bone density modestly.
- Calcium and Vitamin D. Controlled clinical trials have demonstrated that the combination of supplemental calcium and vitamin D can reduce the risk of fracture. Providing adequate daily calcium and vitamin D is a safe and inexpensive way to help reduce fracture risk.
- Smoking Cessation. Although there are no randomized trials to show that stopping smoking increases BMD or reduces the risk of osteoporosis-related fractures, there is good evidence that indicates that smoking is an important risk factor for hip and vertebral fractures. Quitting smoking may help prevent osteoporosis and osteoporosis-related fractures.

Subgroup(S) Of Patients Within Target Population Most Likely To Benefit From These Recommendations

- Calcium, Vitamin D. The older the adult, the greater is the need for and the more likely the benefit from calcium and vitamin D.

POTENTIAL HARMS

- Estrogen Therapy/Hormone Replacement Therapy (HRT). The Women's Health Initiative (WHI) reported increased risks of myocardial infarction, stroke, invasive breast cancer, pulmonary emboli and deep vein phlebitis during 5 years of treatment with Prempro®. Other doses and combinations of estrogen and progestins were not studied and, in the absence of comparable data, their risks should be assumed to be comparable.
- Bisphosphonates (Alendronate and Risedronate). Clinical trials have found the incidence of side effects in patients taking alendronate and risedronate to be no different than the incidence in the placebo groups. However, clinical experience suggests that some patients may experience upper gastrointestinal disorders such as dysphagia, esophagitis, and esophageal or gastric ulcer.
- Raloxifene. Raloxifene increases the risk of deep vein thrombosis to a degree similar to that observed with estrogen. In addition, an increase in hot flashes is observed (~6% over placebo).
- Calcitonin. Some patients experience rhinitis and, rarely, epistaxis.
- Parathyroid Hormone. Some patients experience leg cramps and dizziness.
- Calcium. In most people, there are no significant risks at recommended doses. Calcium carbonate causes constipation in approximately 10% of those taking it.
- Vitamin D. Vitamin D has no known side effects or risks at doses less than 2000 IU per day.

CONTRAINDICATIONS

CONTRAINDICATIONS

Parathyroid hormone (PTH [1-34]): Patients with an increased risk of osteosarcoma (e.g., patients with Paget's disease of bone, prior radiation therapy of the skeleton, bone metastases, hypercalcemia, or a history of skeletal malignancy) should not receive PTH (1-34) therapy.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- It is important to note that the recommendations developed in this report are intended to serve as a reference point for clinical decision making with individual patients. They are not intended to be rigid standards, limits, or rules. They can be tailored to individual cases to incorporate personal facts that are beyond the scope of this guide. Because these are recommendations and not rigid standards, they should not be interpreted as quality standards. Nor should they be used to limit coverage for treatments.
- The information in the guide is chiefly based on evidence from randomized, controlled clinical trials. Data were gathered from published studies and evaluated by an expert panel assembled by the National Osteoporosis Foundation (NOF). Thus, the guide primarily addresses postmenopausal white women. It does not address men, premenopausal women, or women of other races, since there are insufficient data available to formulate comparable recommendations for these populations. Neither does the guide address secondary causes of osteoporosis, which should be excluded by clinical evaluation. This does not imply that osteoporosis affects only postmenopausal white women. Until we have enough data to make specific recommendations for other populations, the risk factors currently identified for white women should be used for others on an individual basis to determine the need for bone density testing and treatment. Furthermore, all people should follow the universal recommendations for prevention in this guide.
- The recommendations herein reflect an awareness of the cost-effectiveness of both diagnostic and treatment modalities. Some effective therapeutic options that would be prohibitively expensive on a population basis might remain a valid choice in individual cases under certain circumstances. This guide cannot and should not be used to govern health policy decisions about reimbursement or availability of services. Its recommendations are not intended as rigid standards of practice, but must be tailored for use by physicians in consultation with their patients.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

National Osteoporosis Foundation. Physician's guide to prevention and treatment of osteoporosis. Washington (DC): National Osteoporosis Foundation; 2003 Apr. 37 p. [14 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1999 (revised 2003 Apr)

GUIDELINE DEVELOPER(S)

American Academy of Orthopaedic Surgeons - Medical Specialty Society
American Academy of Physical Medicine and Rehabilitation - Medical Specialty Society
American College of Obstetricians and Gynecologists - Medical Specialty Society
American College of Radiology - Medical Specialty Society
American College of Rheumatology - Medical Specialty Society
American Geriatrics Society - Medical Specialty Society
American Medical Association - Medical Specialty Society
International Society for Physical Medicine and Rehabilitation - Medical Specialty Society
National Osteoporosis Foundation - Disease Specific Society
The Endocrine Society - Disease Specific Society

GUIDELINE DEVELOPER COMMENT

This guide was developed by an expert committee of the National Osteoporosis Foundation (NOF) in collaboration with a multispecialty council of medical experts in the field of bone health convened by the NOF.

SOURCE(S) OF FUNDING

National Osteoporosis Foundation

GUIDELINE COMMITTEE

Development Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Development Committee Members: Bess Dawson-Hughes, MD, President, NOF, Tufts University, Boston, MA; Deborah T. Gold, PhD, Duke University Medical Center, Durham, NC; Helena W. Rodbard, MD, Rockville, MD; Frank J. Bonner, Jr., MD, Chair, Interspecialty Medical Council, Philadelphia, PA; Sundeep Khosla, MD, Mayo Clinic Foundation, Rochester, MN; Susan Swift, DPA, President, Susan S. Swift, Ltd., New York, NY

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Some of the members of the Guidelines Committee have relationships with pharmaceutical companies, including serving on Scientific Advisory Boards, receiving speakers' fees, and research support. No member of the Development Committee has a significant financial relationship with any individual pharmaceutical company.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: National Osteoporosis Foundation. Physician's guide to prevention and treatment of osteoporosis. Belle Mead (NJ): Excerpta Medica, Inc.; 1999. 28 p.

GUIDELINE AVAILABILITY

Electronic copies: Available from the National Osteoporosis Foundation (NOF). Users will be required to complete an entry form before being permitted to view the full-text guideline.

Print copies: Available from NOF, 1232 22nd Street, NW, Suite 500, Washington, DC 20037.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Lindsay R, Meunier PJ. Osteoporosis: Review of the evidence for prevention, diagnosis and treatment and cost-effectiveness analysis. Osteoporosis Int 1998;8(Suppl 4):S1-S88.

- National Osteoporosis Foundation. Pocket guide to prevention and treatment of osteoporosis. Washington, DC: National Osteoporosis Foundation, 2003. 8 p.

Print copies: Available from NOF, 1232 22nd Street, NW, Suite 500, Washington, DC 20037.

PATIENT RESOURCES

The following are available:

- National Osteoporosis Foundation. The consumer's guide to prevention and treatment of osteoporosis. Washington, DC: National Osteoporosis Foundation, 1999. 1 p.
- National Osteoporosis Foundation. Stand up to osteoporosis: Your guide to staying healthy and independent through prevention and treatment. Washington, DC: National Osteoporosis Foundation, 1999. 25 p.
- National Osteoporosis Foundation. Boning up on osteoporosis. Washington, DC: National Osteoporosis Foundation, 2003. 73 p.

Print copies: Available from NOF, 1232 22nd Street, NW, Suite 500, Washington, DC 20037.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This summary was completed by ECRI on December 3, 1999. The information was verified by the guideline developer on January 7, 2000. This summary was updated by ECRI on January 21, 2004. The information was verified by the guideline developer on March 3, 2004.

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